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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION III  
841 Chestnut Building  
Philadelphia, Pennsylvania 19107

SUBJECT: Meeting with Standard Chlorine

DATE: 12-8-92

FROM: Kate Lose (3HW42)  
DE/MD Section *KL*

TO: File

EPA, DNREC, Weston, and Standard Chlorine met on Monday, December 7, 1992 to discuss the Feasibility Study and the draft outline of Response levels and remediation alternatives currently under consideration (see attached outline and list of attendees).

The following is a summary of some of the items which were discussed at the meeting, some of which may require follow-up:

1. Michael Corbin of Weston explained the attached draft outline in a little more detail. Response levels are those levels at which Standard Chlorine would take action, whereas clean-up levels they hope to achieve through remediation.
2. Michael Kress of Weston, provided an explanation of the "risk ratio" used in calculating the response levels. EPA will request in writing that a more detailed explanation as well as an example be provided in the Feasibility Study.
3. Anne Hiller of DNREC stated that DNREC was satisfied at the response levels selected for the off-site sediments and soils and asked if the numbers generated as a result of the "Vole Study" were used in the development of the response levels. Weston replied, that the ecological assessment had identified a species that was more susceptible at lower concentrations, and in turn used that particular species for developing the response levels.
5. I raised the concern that the alternatives only address surface soils to a depth of three feet. Weston explained that the subsurface soils did not present a risk and therefore response levels were not calculated and alternatives for remediation were not discussed. I raised EPA's concern that the RI had identified at least one "hot spot" (specifically the subsurface soils around the catch basin). Although this media does not present a direct risk to human health, it does serve as a continuing source of a release of contamination to the environment and will

AR307063

certainly impact the time duration for remediation. EPA will require that the Feasibility Study investigate remedial alternatives for the subsurface soils.

6. Karl Kalbacher of DNREC stated that the alternatives identified in Table 3 are not adequate. Specifically, Alternative 2 was very limited and should be expanded. In turn Alternative 3 required some upgrading. Weston agreed to revise the alternatives in to sub-categories such as 3a, 3b, etc. to allow the agencies more flexibility in selecting a remedial alternative for the different medias.
7. In order to keep on schedule, Weston will proceed with the Feasibility Study with the above comments. If the agencies have any other major comments we should get back to Weston by 12-11-92.
8. The Workplan for the Treatability Study will be submitted to DNREC on 12-11-92. Standard Chlorine is planning to proceed with the Treatability Study without DNREC's approval, due to the time constraints. I suggested that they may want to contact Kerr Research Lab directly for guidance.
9. I raised a concern, that EPA's hydrogeologist had located an analytical report that demonstrated that at least one of the wells (TW-50) may contain elevated concentrations of 1,1,1,2-tetrachloroethane. Unfortunately, the report shows that the samples were diluted 100 times and the holding times were exceeded. I was not able to track down any other analysis that revealed elevated levels of this contaminant. The report is limited and the results could certainly be challenged, the contaminant is a VOC and would not significantly alter the risk assessment. Therefore, EPA is not requesting that the RI be revised to address this information. The Feasibility Study must insure that all remedial alternatives are compatible for this compound.

CC Bennie Pasquino  
Dawn Foven  
Bob Davis

AR307064

**METHODOLOGY FOR DETERMINATION OF RESPONSE LEVELS  
STANDARD CHLORINE OF DELAWARE, INC.**

Response levels are set using the following decision tree:

- 1) If an applicable or relevant and appropriate regulation (ARAR) was identified, the standards identified in that ARAR are utilized. This is the case with groundwater and surface water. In the case where multiple standards are identified, the most stringent standard is applied.
- 2) If an ARAR is not identified, a risk-based response level is set using information from the Baseline Risk Assessment (BRA) as presented in the Remedial Investigation Report. The method for determining risk-based response levels is as follows:
  - a) A "risk ratio" (i.e. the ratio of the concentration of contaminants in a media to the ratio of risk posed from the contaminants in a media) is calculated.
  - b) The risk ratio is applied using several acceptable risk criteria (i.e. hazard quotient = 1, carcinogenic risk =  $1.00E-06$ , etc.) to determine the concentration of contaminants (potential response level) required to meet the acceptable risk criteria. This is performed for each media, using the potential exposure scenarios identified in the BRA. The minimum potential response level for each media, under each risk criteria is summarized in Table 1. For example, the potential response level for onsite surface soils is calculated using the Current Worker, Current Visitor, Future Worker, and Future Visitor exposure scenarios, and the lowest calculated potential response level is reported on Table 1.
  - c) When evaluating ecological risk, the No-observable-effect-level (NOEL) and Lowest-observable-effect-level (LOEL) are used as presented in the BRA.
  - d) The various potential response levels are evaluated and a response level is chosen. A brief explanation of the reasons for choosing a particular response level are presented on Table 1.

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November 25, 1992

AR307065

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**Table 1**  
**Summary of Response Levels**  
**Standard Chlorine of Delaware, Inc.**

Media	Potential Response Levels											Selected Response Level	Comments
	ARARs		Response Levels based on Human Health Risk				Response Levels Based on Ecological Risk						
	MCLs	AWQCs	HQ	1.00E-06	1.00E-06	1.00E-04	HQ	NOEL	LOEL				
Onsite Surface Soils	na	na	1,300	62	625	6,250	ne	2	33	625	The LOEL and NOEL risk may not be applicable to a process area where flora is already present in low quantities.		
Offsite Surface Soils	na	na	2,450	410	4,100	41,000	ne	2	33	33	The LOEL is most appropriate; the NOEL is too stringent (when compared to human risks)		
Offsite Sediments	na	na	14,300	339	3,390	33,900	471	2	33	33	As above.		
Offsite Surface Water	na	See Table 2	0.24	0.02	0.22	1.00	0.10	68	ne	See Table 2	Federal and DNREC AWQC used.		
Ground-water	See Table 2	na	0.51	0.04	0.36	3.56				See Table 2	Federal MCLs used		

**Comments:**

- ne - Not evaluated
- na - Not applicable
- MCL - Maximum contaminant level
- AWQC - Ambient water quality criteria
- HQ - Hazard quotient; Response level based on non-carcinogenic risk.
- 1.00E-06 - 1 in 1,000,000 excess cancer risk.
- 1.00E-05 - 1 in 100,000 excess cancer risk.
- 1.00E-04 - 1 in 10,000 excess cancer risk.
- NOEL - No-observable-effect-level.
- LOEL - Lowest-observable-effect-level.

- 1) All concentrations are for total target compounds, expressed as ppm (mg/kg or mg/L)
- 2) ARARs are used wherever applicable.
- 3) The 1.00E-06 risk values are not considered appropriate for this industrial location, and, in some instances, cannot be practically achieved.
- 4) Response levels for groundwater and offsite surface water were based on applicable regulations (MCLs and AWQC resp.)

AR307066

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Table 2  
Summary of ARARs  
Standard Chlorine of Delaware, Inc.

Compound	Groundwater	Surface Water		Comment
	Federal MCL (mg/L)	Federal AWQC (1) (mg/L)	DNREC AWQC (2) (mg/L)	
Chlorobenzene	0.1	0.05 (4)	26.1	Fed. Used
1,3-Dichlorobenzene	NP	0.763 (5)	4.3	Fed. Used
1,2-Dichlorobenzene	0.6	0.763 (5)	21.8	Fed. Used
1,4-Dichlorobenzene	0.075	0.763 (5)	24.	Fed. Used
1,3,5-Trichlorobenzene	NP	NE	NE	
1,2,4-Trichlorobenzene	0.07	0.05 (4)	19.	Fed. Used
1,2,3-Trichlorobenzene	NP	0.05 (4)	NP	Fed. Used
1,2,4,5-Tetrachlorobenzene	NP	0.05 (4)	NP	Fed. Used
1,2,3,4-Tetrachlorobenzene	NP	0.05 (4)	NP	Fed. Used
Pentachlorobenzene	NP	0.05 (4)	NP	Fed. Used
Hexachlorobenzene	0.001 (3)	0.05 (4)	0.001	DNREC Used
Nitrobenzene	NP	27.	2.2	DNREC Used
Metachloronitrobenzene	NP	NE	NE	
Benzene	0.005	5.3	0.089	DNREC Used
Ethylbenzene	0.7	NE	NE	
Toluene	1.	NE	NE	

NOTES:

NP - No standard promulgated.

NE - Not evaluated; compound not detected in media.

- 1) Protection of aquatic organisms; fresh water chronic criteria used.
- 2) Protection of human health; fish ingestion criteria used.
- 3) Proposed value.
- 4) General chlorinated benzenes criteria used.
- 5) General dichlorobenzenes criteria used.

AR307067

12/2/92

**DRAFT**

**TABLE 3**  
**SUMMARY OF ALTERNATIVES FOR DETAILED ANALYSIS**  
**STANDARD CHLORINE OF DELAWARE, INC.**

MEDIA	ALTERNATIVE 1	ALTERNATIVE 2	ALTERNATIVE 3	ALTERNATIVE 4	ALTERNATIVE 5
Surface Soils <sup>1</sup>	No Action	Limited Action - Fencing hot spots. - Deed restrictions	Containment - Capping of hot spots. - Silt fences to prevent transport through erosion. - Surface water diversion for runoff. - Deed restrictions. - Backfill of hot pile into sedimentation basin.	Thermal Desorption - Excavation of contaminated surface soils above response levels. - Treatment of the excavated soils using thermal desorption. - Surface water controls as necessary.	Biological Treatment - In situ or ex situ treatment of soils above the response levels. - Surface water controls as necessary.
Sediments <sup>2</sup>	No Action	Limited Action - Fencing hot spots. - Impose restricted wetland use.	Containment - Sediment barriers (silt fences, aggregate materials) to prevent sediment transport. - Impose restricted wetland use. - Solidify and cap sedimentation basin.	Thermal Desorption - Excavation/dredging of contaminated sediments above response levels. - Treatment of these sediments using thermal desorption. - Sediment barriers as necessary.	Biological Treatment - In situ or ex situ treatment of sediments above the response levels. - Sediment barriers as necessary.

AR307068

November 25,

DRAFT



TABLE 3 (Cont'd)  
SUMMARY OF ALTERNATIVES FOR DETAILED ANALYSIS  
STANDARD CHLORINE OF DELAWARE, INC.

MEDIA	ALTERNATIVE 1	ALTERNATIVE 2	ALTERNATIVE 3	ALTERNATIVE 4	ALTERNATIVE 5
Ground-water	No Action	Limited Action - Deed and well restrictions.	Containment/Treatment - Enhance existing groundwater recovery system to contain all groundwater exiting site. Will include use of extraction wells and/or vertical barriers (interceptor trenches). - Treatment using existing or modified groundwater treatment system (air stripping).	Containment/Treatment - Enhance existing groundwater recovery system to contain all groundwater exiting site. Will include use of extraction wells and/or vertical barriers (interceptor trenches). - Use of product recovery wells to attempt to remove NAPL. - Treatment using existing or modified groundwater treatment system (air stripping).	Containment/Treatment - Same as Alternative 4.
Surface Water <sup>3</sup>	No Action	Limited Action - Impose restricted wetland use.	Limited Action - Impose restricted wetland use <sup>4</sup> .	Same as Alternative 3.	Same as Alternative 3.

NOTES:

- 1) Surface soils include soils to a depth of 3 feet, and soils contained in the soil piles.
- 2) Sediments include sediments in the Unnamed Tributary and Red Lion Creek to a depth of 1-1/2 feet, and those sediments contained in the sedimentation basin.
- 3) Surface water encompasses surface waters contained in the Unnamed Tributary and Red Lion Creek. Other surface waters (such as runoff and runoff in the plant area) are covered under surface soils.
- 4) Concentrations generally exceed response levels only in Unnamed Tributary. Remedial actions in other media (e.g. groundwater containment) are expected to improve surface water quality.

307069

November 25, 1992

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AR307070